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STANDARD VERSUS INDIVIDUALIZED HIERARCHIES IN DESENSITIZATION TO REDUCE TEST ANXIETY.

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FIFTY-FOUR TEST-ANXIOUS COLLEGE FRESHMEN FROM STANFORD UNIVERSITY WERE RANDOMLY ASSIGNED TO ONE OF THREE GROUPS--(1) A DESENSITIZATION GROUP WORKING WITH INDIVIDUALIZED ANXIETY HIERARCHIES, (2) A DESENSITIZATION GROUP WORKING WITH A SINGLE STANDARD HIERARCHY, AND (3) A NO-TREATMENT CONTROL GROUP. THE CRITERIA CONSISTED OF SELF-RATINGS OF ANXIETY BEFORE AND DURING EXAMINATIONS, SCORES ON A TEST ANXIETY SCALE, AND FINAL EXAMINATION GRADES. THE FINDINGS WERE AS FOLLOWS--(1) STUDENTS WHO RECEIVED DESENSITIZATION RATED THEMSELVES AS SIGNIFICANTLY LESS ANXIOUS ABOUT EXAMINATIONS (BOTH BEFORE AND DURING THEIR FINAL EXAMINATIONS) AS COMPARED WITH A NO-TREATMENT CONTROL GROUP, (2) FINAL EXAMINATION GRADES OF THE DESENSITIZATION GROUPS WERE SLIGHTLY, BUT NOT SIGNIFICANTLY, HIGHER THAN THE CONTROL GROUP, AND (3) NO DIFFERENCE IN THE RELATIVE EFFECTIVENESS OF INDIVIDUALIZED VERSUS STANDARD HIERARCHIES WAS FOUND. CONSIDERING THE RESULTS, LIMITATIONS OF THE STUDY ARE (1) THE SAMPLE WAS NOT REPRESENTATIVE OF NORMAL COLLEGE POPULATION IN ABILITY, (2) THE TEST ANXIETY CRITERION MEASURES MIGHT HAVE BEEN MORE OBJECTIVE, AND (3) STUDENTS MIGHT HAVE COMPILED THEIR OWN INDIVIDUALIZED ANXIETY HIERARCHY INSTEAD OF ALTERING A STANDARD ONE. (AF)

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Standard Versus Individualized Hierarchies in Desensitization to Reduce Test Anxiety

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Fifty-four test-anxious college freshmen were randomly assigned to either (1) desensitization with individualized anxiety hierarchies, (2) desensitization with a single standard hierarchy, or (3) a no treatment control group. Criteria consisted of self-ratings of anxiety before and during examinations, scores on a test anxiety scale, and final examination grades. Findings: (1) Students who received desensitization rated themselves as significantly less anxious about examinations, both before and during their final examinations, as compared with a no treatment control group, (2) Final examination grades of the desensitization groups were slightly, but not significantly, higher than the control group, (3) No difference in the relative effectiveness of individualized versus standard hierarchies was found.

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Standard Versus Individualized Hierarchies in Desensitization to Reduce Test Anxiety[1]

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Each year college counselors work with freshmen who experience extreme anxiety before and during midterm and final examinations. Many of these students have the ability to do well on their examinations but perform poorly because of their anxiety (Alpert & Haber, 1963; Paul & Eriksen, 1964). Some students experience difficulty in organizing a logical and coherent answer to an essay question, while others report that their "mind goes blank" when they encounter a difficult mathematics problem. Still others find it difficult to eat or sleep normally the day before examinations start. Such problems are evidence of what can be labeled "test anxiety."

Little work has been done on finding an effective method to reduce students' test anxiety. Sarason (1958) found that reassurance

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did seem to have a facilitative effect on the verbal learning of high test-anxious subjects. Hoehn & Saltz (1956) found that anxious students tended to be helped by interviews, although rigid students were more likely to fail if interviewed. The results were further affected by the type of interviews. Interviews in which students were encouraged to complain produced the interaction noted above while interviews oriented toward the student's goal and sources of interest and satisfaction did not. Paul & Ericksen (1964) found that high test-anxious students (as measured by Mandler & Sarason, 1952) did better on a comparable "experimental" examination given later on the same day of the real examination, while low test-anxious students did more poorly.

McKeachie, Pollie & Speisman (1955) gave half their students answer sheets with spaces in which they were invited to "feel free to comment" on the test questions while the other half of the students were given standard answer sheets. Students who had the opportunity to write comments made "reliably" higher scores than those who used the standard answer sheets. The authors believed that giving students an opportunity to comment on test questions reduced anxiety and its concomitant detrimental effects.

Only one case study (Paul, 1964) was found where the desensitization process was used as a means of reducing test anxiety. Wolpe (1952) was the first to publish an account of the desensitization procedure. Basically, desensitization consists of verbally presenting carefully graded situations which are increasingly anxiety producing (an "anxiety hierarchy") to a deeply relaxed client until he is able to visualize

the most stressful scenes on the list without experiencing any anxiety. Wolpe's subsequent writings on the subject (1958, 1961, 1962, 1964) show further clinical evidence for the effectiveness of the procedure for eliminating objectively inappropriate fears in human beings.

Thus far, systematic desensitization has been shown to be an effective method of eliminating many types of phobic behavior, but no study has specifically evaluated desensitization in reducing test anxiety.

A classical conditioning paradigm can be used to explain how students become overly anxious about taking examinations. A child bringing home an examination with a grade lower than that expectd by his parents is likely to be punished, directly or indirectly, by his parents. The repeated association of punishment with examinations will produce an increase in his anxiety whenever events associated with examinations occur in the future. The freshman year at college may heighten fear of examinations. An increased level of competition combined with more complex subject matter challenges many students for the first time. Thus, the test anxiety of most college students can be viewed as a fear of events associated with the testing situation

Since desensitization has been shown to be an effective method of reducing other fears, this study was designed to test the efficacy of using desensitization as a procedure in reducing undue test anxiety of college freshmen.

Other studies have examined certain variables relevant to the desensitization process. Among these variables were training in

muscular relaxation (Davison, 1965; Lang, Lazovik & Reynolds, 1965); the importance of suggestability within the therapeutic relationship (Lang, Lazovik, & Reynolds, 1965); and a comparison of group vs. individual desensitization (Paul & Shannon, 1966).

One assumption in all these studies has been that the anxiety hierarchy must be adapted to each individual undergoing desensitization or must be capable of being modified to suit each individual within the group situation. Anxiety hierarchies are usually constructed by both counselor and client. The client lists relevant anxiety producing situations which he then ranks from least to most anxiety producing. This individualized hierarchy, which may be modified at any time during the desensitization process, is thus specifically tailored to the individual client.

The individualized hierarchies from many subjects with the same problem may be similar enough in content to permit their compilation into a single standard hierarchy. It is possible that a standard hierarchy could be utilized as effectively in reducing test anxiety as the individualized hierarchies and at the same time reduce the time necessary for completion of an effective desensitization treatment. However, both Lazarus (1960) and Wolpe (1958) emphasize the importantance of placing the items in the anxiety hierarchies in an order which is specifically tailored to each individual. Items not in the "correct" order might cause repeated signaling by the client and negate any beneficial effects from the desensitization process.

Method

Sample

The sample was selected from the freshmen class of Stanford University. Most freshmen (N = 1078, males = 830, females = 248) took a test anxeity scale as part of a three-hour psychological assessment during orientation week. This scale is a refinement of a scale previously constructed by Emery and contains 18 items known to discriminate between a group of Stanford undergraduates who called themselves "test anxious" and another group containing a random sample of Stanford undergraduates. Those who called themselves "test anxious" scored significantly higher ($p \leq .05$) on all 18 items than the random sample group.

The nineteenth item asks each student to respond to the direct statement: "I feel that I am unduly anxious about taking examinations." Scores were computed by assigning the following values to each response on the five-point scale: Rarely or Never, 1; Infrequently, 2; Occasionally, 3; Frequently, 4; Almost Always or Always, 5. Total scores were the sum of the values obtained for each of the nineteen questions. A total of 240 students (males = 165, females = 75) were identified as "test anxious" if they met the following criteria:

(1) They answered the nineteenth question "Frequently" or Almost Always or Always." This criterion was met by 145 students.

(2) Their total score on the scale exceeded one standard deviation above the mean score. This criterion was met by 95 students; 117 students met both criteria.

Shortly after students had received the results of their Fall Quarter midterm examinations, a letter was sent to each freshman identified as "test anxious" (N = 240) inviting participation in a project to reduce test anxiety. Students were informed that everyone desiring to participate could not be accommodated because of limited staff and facilities. The purpose, nature of treatment and time required were explained. Ninety-six freshmen (males = 72, females = 24) responded to this letter indicating they desired to participate.

Since the male-female ratio in the freshmen class was approximately 2:1 (approximately 150 freshman females did not take the test anxiety scale), the 2:1 ratio was also used in this study. Thus, of the 96 volunteers, 36 males and 18 females were randomly selected and randomly assigned to one of three groups: (1) desensitization using an individualized hierarchy, (2) desensitization using a standard hierarchy, (3) no treatment control. Each group had 12 males and 6 females. Test anxiety scale means and standard deviations at each stage of the sample selection process are shown in Table 1. After random assignment, no significant differences were found between groups on age, first quarter grade-point average, or College Entrance Examination Board (CEEB) scores.

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Insert Table 1 here
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Treatment

Nine counselors were selected from graduate students in clinical and counseling psychology and trained in the desensitization technique. Students in the two experimental groups met with counselors during

Winter, Quarter, twice per week for up to eight weeks, until the desensitization process was completed. Each counselor worked with four students--two from each experimental group.

The desensitization process was identical for each experimental group except for construction of the anxiety hierarchies. The standard test anxiety hierarchy was constructed by compiling the individualized hierarchies of 15 test-anxious subjects collected in a pilot study by Emery. The standard hierarchy consisted of 16 situations ranked from least anxiety producing, "The teacher announces and discusses a course examination (to be held in three weeks) with the class," to most anxiety producing, "Having thirty minutes left to complete an examination and an hour's worth of work to do."

The group receiving individualized hierarchies was given the same list of 16 situations but in a random order. Each student in this group was then given the following directions:

> Each statement on the following sheet describes a situation related to taking exams. If you found yourself in any one of these situations, you might be bothered quite a bit--somewhat--or not at all. Look them over. If you can think of any other situations related to taking exams that bother you a lot, add them to the list. You may write on the back if you wish.
>
> When the list is complete, look all the situations over again quickly. Then, pick the situation that would bother you the most and place a "1" in the column to the left of it. Next,

look at the remaining situations. Of these, pick the one that would bother you the most and place a "2" in the column to the left of it. Continue this procedure until you have ranked all items.

Desensitization was accomplished using the same standard hierarchy for all students in one experimental group but using the individualized hierarchy developed for each student in the other experimental group. All of the students who received desensitization completed the treatment. The no treatment control group was informed that their cards had not been among those drawn by lot to participate but that they would be contacted later.

Criterion Measures

Three criteria were used to judge the efficacy of the treatment procedures.

1. Winter Quarter final examination grades in freshmen History adjusted for Fall Quarter final examination grades in freshmen History. History was used because it was the only common examination taken by all freshmen. These grades were obtained by direct communication with all 26 freshmen History instructors and were then quantified so that A = 4.0, A- = 3.7, B+ = 3.3, etc. During Fall and Winter Quarters, all freshmen took the same final examinations. The exams lasted 4 hours and consisted of four essay questions.

2. Post-test anxiety scale scores adjusted for pre-test anxiety test scores. Post-test scores were obtained by mailing letters to all 54 students one week prior to the final examination week of the Winter Quarter, 1966. Almost identical letters were sent to the experimental

groups and to the control group. Both letters contained the identical test anxiety scale these students had completed during September, 1965.

3. Self-ratings of anxiety during examinations and self-ratings before examinations. The mean difference of these two ratings as well as the absolute value of each was used. A lowering of anxiety during the examination would be expected to facilitate performance on the examination.

These self-ratings were obtained by a second letter sent to all 54 students one week later just as final examinations were beginning. Both experimental groups and the control group received the identical letter. Each letter contained a rating sheet for each examination a student had. The students rated their level of anxiety both before and during each final examination on a seven-point scale from "1" ("Very Calm") to "7" ("Very Intense Anxiety"). Intensive follow-up procedures were used so that all 54 students returned both the test anxiety scale and the self-ratings.

Analysis to Test Hypotheses

An analysis of covariance was used to examine for significant differences (.05 level) between groups on the first two criteria. A one-way analysis of variance was used to examine for significant differences (.05 level) between groups on the third criterion.

All three criterion measures were used in testing both hypotheses:

Hypothesis One: Desensitization treatment (combined experimenal groups) will be more effective than the control procedure.

Hypothesis Two: Desensitization utilizing an individualized hierarchy will be more effective than desensitization utilizing a standard hierarchy.

Results

The means reported in Table 2 indicate that desensitization is an effective method of reducing test anxiety based on the test anxiety scale scores and the self-ratings. The final examination grades showed trends in the predicted direction which did not reach statistical significance.

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Insert Table 2 here
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The crucial dividing line on the self-rating scale is between a "3" rating (mild anxiety--not bothersome) and a "4" rating (mild anxiety--bothersome). The desensitization groups not only experienced a decrease in anxiety during the examination, but also felt less anxiety before the examination.

On none of the criteria was one experimental group more efficacious than the other. Thus, the assumption that a specific hierarchy is necessary in the desensitization process was not verified under the conditions of this study. Complete descriptions of procedures and analyses are available in Emery (1966).

Discussion

The following conclusions seem warranted:

1. Students who received desensitization rated themselves as significantly less anxious about examinations, both before and during their final examinations, than a no treatment control group.

2. Final examination grades of the desensitization groups were slightly, but not significantly, higher than the control group.

3. No difference in the relative effectiveness of individualized versus standard hierarchies was found.

However, several limitations of the study must be considered. The sample was not representative of a normal college population in ability. The mean score for combined mathematics and verbal sections of the CEEB examinations was 1310 (90th percentile on national norms) for the 54 students participating. Considering Spielberger & Katzenmeyer's (1959) findings that academic anxiety evidenced by those students of high ability seems to have a facilitating rather than debilitating effect on academic performance, the use of Stanford students may restrict generalizibility of the findings.

Selection of test anxiety criterion measures is another problem. Some of the students who returned their post-test anxiety scales the week before examinations indicated that they would not be sure of how they felt about taking examinations until after their examinations were over. Administering the post-tests after examinations was not done for fear of measuring more of a "relief that examinations are over" rather than a reduction in test anxiety. More objective measures of students' test anxiety need to be developed. Physiological measures such as pulse rate and/or G.S.R. may be more meaningful than the self-report scales used here.

Within the desensitization treatment itself a number of assumptions were made which may not be warranted. For instance, it was assumed that (a) all students attained, at least, a minimal degree of muscular

relaxation, and (b) all students were clearly able to visualize items on their hierarchies. The number of times a student signaled that he or she felt anxious while relaxed was not controlled either. Some students never signaled that they felt anxious, others signaled quite frequently.

The 60 percent overlap between the individualized and standard hierarchies may have ruled out any possibility of differential effectiveness. However, one can infer that the standard hierarchy was effective. Another alternative would have been to have the students who used an individualized hierarchy construct their own hierarchy "from scratch" rather then altering, adding to and deleting from the standard hierarchy. This would have reduced the overlap between hierarchies and enabled a clearer test of the differences between the two ways of constructing hierarchies.

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Table 1

Means and Standard Deviations for Groups on the Test Anxiety Scale

Group	Males			Females		
	N	M	SD	N	M	SD
Freshmen Class Taking Anxiety Scale September 1965*	830	43.26	11.11	248	44.76	12.38
Students Receiving Letters of Invitation	165	57.18	10.13	75	58.23	11.31
Students Indicating Interest in Special Help	72	58.44	9.64	24	59.14	9.91
Students Randomly Assigned to Final Sample	36	58.98	8.41	18	59.40	8.78

*The corrected split-half reliability for the scale with N = 1078 was .76.

Table 2

Means, Standard Deviations and F-Values

to Test Each Hypothesis

Criteria			Desensitization Individualized Hierarchy (1)	Desensitization Standard Hierarchy (2)	Control Group (3)	F for Hypothesis 1 (1)and (2) vs. (3)	F for Hypothesis 2 (1) vs. (2)
Final Exam Grades	History Fall Quarter	M	2.49	2.49	2.55		
		SD	0.88	0.93	1.00		
	History Winter Quarter	M	2.82	2.83	2.64	1.58	0.00
		SD	0.82	0.83	0.76		
Test Anxiety Scale Scores	September 1965	M	59.2	58.8	59.4		
		SD	9.0	8.6	8.6		
	March 1966	M	54.4	58.9	64.0	6.83*	2.37
		SD	12.2	8.5	12.7		
Self-Rating of Anxiety Scores	Before Final Exams	M	3.07	3.23	4.42	13.52***	0.99
		SD	0.85	1.01	0.91		
	During Final Exams	M	2.60	2.81	4.58	14.78***	1.23
		SD	0.78	0.61	1.33		
	Difference	M	0.47	0.42	-0.16	6.25*	0.03
		SD	0.85	0.83	0.83		

* Significant at .05 level

*** Significant at .001 level